

WE CLAIM:

1. A bracket comprised of a polygonal body with
  - a) a first side and a second side defining a thickness with a cavity extending therethrough to further define a cavity wall;
  - b) a first end and a second end adjacent to the first end, wherein the first end and the second end each have mutually perpendicular outer surfaces and each outer surface extends or may be projected to extend to intersect with the other outer surface to form a base corner;
  - c) wherein an imaginary first penetration line extends from the base corner away from both the first end and the second end and wherein the first penetration line intersects and passes through the cavity wall opposite the base corner;
  - d) wherein a first passageway extends about the first penetration line through the cavity wall;
  - e) wherein an imaginary second penetration line extends from and in a direction perpendicular to the outer surface of the first end; and
  - f) wherein a second passageway extends about the second penetration line through the cavity wall of the first end.
2. The bracket according to claim 1 wherein the imaginary first penetration line forms an angle of between 30-60° with the outer surface of the first end.
3. The bracket according to claim 2 wherein the angle is 45°.
4. The bracket according to claim 1 wherein the cavity wall surrounding the first passageway has a convex shape.
5. The bracket according to claim 1 wherein the polygonal body has the shape of a pentagon.

6. The bracket according to claim 1 wherein the cavity has a plurality of sides.
7. The bracket according to claim 1 wherein the polygonal body has the shape of a rectangle.
8. The bracket according to claim 1 wherein the polygonal body has the shape of a triangle.
9. The bracket according to claim 1 wherein the cavity has sides which form a rectangle.
10. The bracket according to claim 1 wherein at least one side of the cavity is circular.
11. The bracket according to claim 1 further including a third passageway about the second penetration line and through the cavity wall opposite the second passageway.
12. The bracket according to claim 1 wherein the first passageway is biased toward the first side.
13. The bracket according to claim 1 wherein the first passageway is comprised of two portions that taper down and intersect approximately midway between the wall thickness.
14. A bracket comprised of a polygonal body with
- a) a first side and a second side defining a thickness with a cavity extending therethrough to further define a cavity wall, wherein the polygonal body has the shape of a rectangle and wherein the cavity has sides which form a rectangle;
  - b) a first end and a second end adjacent to the first end, wherein the first end and the second end each have mutually perpendicular outer surfaces and each outer surface extends or may be projected to extend to intersect with the other outer surface to form a base corner;
  - c) wherein an imaginary first penetration line extends from the base

corner away from both the first end and the second end and wherein the first penetration line intersects and passes through the cavity wall opposite the base corner and forms an angle with the outer surface of the first end of between 30-60°;

d) wherein a first passageway extends about the first penetration line through the cavity wall and wherein the cavity wall surrounding the first passageway has a convex shape;

e) wherein an imaginary second penetration line extends from and in a direction perpendicular to the outer surface of the first end; and

g) wherein a second passageway extends about the second penetration line through the cavity wall of the first end.

15. A structural panel comprising:

a) a first track;

b) a second track;

c) a plurality of studs therebetween connected to and securing the first track to the second track, wherein the intersection of the outermost studs and the first track and the second track define four inner corners;

d) at least one pair of brackets wherein each bracket of a pair is secured to one of two diametrically opposed inner corners; and

e) a cross member secured at a first end to one of a pair of brackets and at a second end to the other of the pair of brackets; and

f) a passageway extending through the bracket for receiving a connecting member to secure the bracket to a building slab.

16. The structural panel according to claim 15 wherein there are two pairs of

brackets.

17. The structural panel according to claim 15 wherein each bracket is welded to one of either the top or second track and to the adjacent outermost stud.

18. The structural panel according to claim 15 wherein each cross member has threaded ends which extend through bores in the brackets and are secured to the brackets with mating nuts, such that the tension in the cross member may be adjusted by tightening or loosening the nuts against the brackets.

19. The structural panel according to claim 18 further including cylindrical washers on each cross member between the nuts and the bores in the brackets.

20. The structural panel according to claim 18 further including hillside washers on each cross member between the nuts and the bores in the brackets.

21. The structural panel according to claim 18 further including D-shaped washers on each cross member between the nuts and the bores in the brackets.

22. The structural panel according to claim 15 wherein each bracket is comprised of a polygonal body with

a) a first side and a second side defining a thickness with a cavity extending therethrough to further define a cavity wall;

b) a first end and a second end adjacent to the first end, wherein the first end and the second end each have mutually perpendicular outer surfaces and each outer surface extends or may be projected to extend to intersect with the other outer surface to form a base corner;

c) wherein an imaginary first penetration line extends from the base corner away from both the first end and the second end and wherein the first penetration line intersects and passes through the cavity wall opposite the base corner;

d) wherein a first passageway extends about the first penetration line through the cavity wall;

e) wherein an imaginary second penetration line extends from and in a direction perpendicular to the outer surface of the first end; and

f) wherein a second passageway extends about the second penetration line through the cavity wall of the first end.

23. A building comprised of:

a) a structure having a horizontal load bearing slab;

b) a first structural panel having

1) a first track;

2) a second track;

3) a plurality of vertical studs therebetween connected to and securing the first track to the second track, wherein the intersection of the outermost studs and the first track and the second track define four inner corners;

4) at least one pair of brackets wherein each bracket of a pair is secured to one of two diametrically opposed inner corners; and

5) a cross member secured at a first end to one of a pair of brackets and at a second end to the other of the pair of brackets; and

6) a passageway extending through the bracket for receiving a connecting member; and

c) a connecting member extending through the slab and through the passageway of the bracket to secure the panel to the slab.

24. The building according to claim 21 further including:

a) a second structural panel which is identical to the first structural panel, wherein the slab has a top side and an under side and wherein the first structural panel is mounted upon the top side of the slab and the second structural panel is mounted upon the under side of the slab such that the passageways extending through each bracket for receiving a connecting member are aligned with each other; and

b) a connecting member extending through the slab and through the passageway of each bracket to secure each panel to the slab and to the other panel.

25. The building according to claim 23 wherein the connecting member is a bolt threaded at each end and the connecting member is secured to each bracket by a threaded nut.

26. The building according to claim 24 wherein the connecting member is secured with epoxy within a bore in the slab.

27. The building according to claim 22 wherein the load bearing slab is a composite floor having a metal profile member containing concrete.

28. A method for fabricating a building using prefabricated steel panels comprising the steps of:

a) securing a bracket within each inner corner of a steel panel defined by a first track, a second track and the outermost studs of a plurality of vertical studs between the first track and the second track and connecting each bracket to a diametrically opposing bracket with a tension adjustable connection to form a first panel assembly;

b) repeating step a) to form a second panel assembly;

c) positioning the first panel assembly on one side of a first horizontal slab;

d) positioning a second panel assembly on the other side of the horizontal

slab; and

e) securing the first panel assembly to the second panel assembly using a connecting member extending through the slab and connected to one bracket in each panel assembly.

29. The method for fabricating a building according to claim 28 further including the steps of:

f) positioning one side of a second horizontal slab against the other side of the first panel assembly;

g) repeating step a) to form a third panel assembly;

h) positioning the third panel assembly against the other side of the second horizontal slab;

i) securing the first panel assembly to the third panel assembly using a tie rod extending through the slab and connected to one bracket in each of the first and third panel assemblies.

30. The method for fabricating a building according to claim 28 wherein the tension adjustable connections are tightened after the first panel assembly is secured to the second panel assembly.

31. A method for installing a structural building panel comprising the steps of:

a) securing at least one panel to a support surface;

b) attaching to a top surface of the panel structural decking;

c) passing threaded connecting members from the panel through the decking;

d) pouring concrete on the decking and embedding upper ends of the threaded connecting members in the concrete;

e) waiting for the concrete to partially harden to define a concrete surface; and

f) then rotating the threaded connecting members so they pass through the concrete; thereby providing an arrangement whereby additional panels may be placed upon the concrete surface and attached to the upper ends of the connecting members to secure the panel to the concrete surface.

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